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Cotton Gin Operating Costs in the San Joaquin Valley of California— 1971/72

ABSTRACT

Capacity utilization and operating costs were analyzed for a sample of 41 gins representing 27 percent of the total ginning capacity and 26 percent of the total ginnings for the San Joaquin Valley of California during the 1971/72 season. Utilization of sample gin plant capacity averaged 53 percent, based on a typical ginning season of 906 operating hours and averages of 16.8 bales in rated hourly capacity and 6,754 bales in annual volume ginned. Operating costs per bale averaged: Out-of-pocket, \$18.86; total, \$23.24; and total standardized, \$26.67.

Keywords: Cotton, ginning, costs, rates, capacity, utilization.

PREFACE

This report is part of a series of ginning cost studies conducted by the U.S. Department of Agriculture in the major producing areas of the Cotton Belt. Other geographic areas now covered in annual reports are West Texas, the Blacklands of Texas, the Lower Rio Grande Valley of Texas, and the Mississippi Delta. Findings are derived from gin operating cost records mailed in annually from a sample of gins in each area. Area ginners use these findings as benchmarks or guides in evaluating the efficiencies of their own operations.

Appreciation is extended to gin owners, managers, and accountants for their cooperation and assistance. Statistical analyses of ginning volume and cost data were carried out using computer facilities at the University of Arizona.

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by

Charles A. Wilmot, Dale L. Shaw
and Betty K. Heron 1/
Commodity Economics Division
Economic Research Service

INTRODUCTION

The cotton producing area of California's San Joaquin Valley encompasses parts or all of Kern, Kings, Tulare, Fresno, Madera, and Merced counties. During the 1971/72 ginning season there were 212 active gins in these six counties. 2/

Sample gins 3/ in this area were divided into four size groups by rated hourly capacities: group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; and group 4--21 bales or more. A random sampling technique was used in selecting the study gins for each group. The 41 gins selected as the sample represent approximately 27 percent of the season's total ginning capacity and about 26 percent of the total ginnings for the area.

FINDINGS

In 1971/72 the sample gins ranged in rated hourly capacity from 7 to 74 bales and averaged 16.8 bales (table 1). Total volume ginned among the sample gins ranged from 1,452 to 34,959 bales, with an average of 6,754 bales. The corresponding rate of gin plant capacity utilization 4/ ranged from 21 to 145 percent with an overall average of 53 percent.

1/ Wilmot and Shaw are agricultural economists, and Heron is an economic assistant.

2/ Cotton Ginnings in the United States, Crop of 1971, U.S. Dept. of Commerce, Bur. of Census, Washington, D.C., Aug. 1972.

3/ A sample gin is a ginning operation of one or more plants, in one or more locations, operated as a single unit.

4/ Ratio of volume ginned to estimated total seasonal ginning capacity, without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of rated capacity. Several of the sample gins stored seed cotton either in the field or on the gin yard. This practice, in effect, extends the ginning season and makes it possible to exceed 100 percent capacity utilization.

Table 1--Rated hourly capacities, volumes ginned, and capacity utilization, sample gin plants by size group, San Joaquin Valley, California, 1971/72

Gin size group	Rated hourly capacity 1/		Annual volume ginned		Rate of capacity utilization 2/	
	Range	Average	Range	Average	Range	Average
	Bales				Percent	
Group 1.....	7- 8	7.8	1657- 5125	3149	31- 83	52
Group 2.....	9-11	9.9	1452- 6439	3821	21- 84	50
Group 3.....	12-20	16.9	3653-13410	7230	35-145	56
Group 4.....	21-74	36.4	6135-34959	14242	33-101	51
Combined....	7-74	16.8	1452-34959	6754	21-145	53

1/ Based on observations in plants operating under normal conditions.

2/ Ratio of volume ginned to estimated total seasonal ginning capacity, without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of rated capacity. Several of the sample gins stored seed cotton either in the field or on the gin yard. This practice, in effect, extends the ginning season and makes it possible to exceed 100 percent capacity utilization.

Operating Costs at Existing Rates of Plant Capacity Utilization

Economies of scale are evident in all three types of operating costs shown (table 2). 5/ On a per bale basis, and using the averages for groups 1 and 4, respectively, as the upper and lower limits, out-of-pocket costs ranged from \$23.50 to \$16.75; total costs from \$27.47 to \$21.06; and total standardized costs from \$29.25 to \$25.32.

Weighted average per bale costs for all sample gins combined were: out-of-pocket, \$18.86; total, \$23.24; and total standardized, \$26.67.

Operating Costs Assuming 70 Percent Plant Capacity Utilization

To allow cost comparisons at the same relative ginning volume levels, each group average cost and the weighted average cost were adjusted to a uniform capacity utilization of 70 percent (table 3). 5/ This adjustment lowered costs per bale substantially for all groups, pointing up the beneficial effect of increased volumes on unit operating costs regardless of plant size. Raising the average rate of plant capacity utilization for all gins combined from 53 to 70 percent resulted in per-bale operating cost reductions of \$2.06 in out-of-pocket costs, \$3.15 in total costs, and \$4.00

5/ See Costing Methods in appendix for definition of costs.

Table 2--Costs per bale in sample gin plants by size group, and average for all plants, San Joaquin Valley, California, 1971/72 ^{1/}

Cost item <u>2/</u>	Group 1		Group 2		Group 3		Group 4	
	Range <u>3/</u>	Average						
<u>Dollars</u>								
Management.....	4.27-14.14	7.87	2.56-18.88	7.05	1.36- 4.31	2.40	1.26- 3.63	1.95
Insurance.....	.44- 1.02	.54	.38- 1.19	.50	.29- 1.05	.54	.36- .93	.55
Taxes.....	.75- 2.18	.99	.43- 2.76	.93	.56- 1.69	.98	.52- 1.91	.02
Energy.....	1.10- 3.92	1.62	1.31- 3.63	1.86	1.28- 3.36	1.92	1.48- 2.15	1.77
Labor.....	3.10- 7.15	4.50	1.85- 6.86	3.53	1.84- 6.55	3.91	2.60- 4.75	3.51
Bagging and ties...	2.98- 3.40	3.11	2.79- 3.44	3.00	2.38- 4.42	3.66	3.35- 4.02	3.70
Repairs.....	2.35- 6.66	3.14	1.58- 4.80	2.52	1.49- 5.72	3.12	1.64- 4.58	2.78
Miscellaneous.....	.58- 5.22	1.73	.52- 3.39	1.15	.49- 6.41	1.85	.66- 2.56	1.48
Out-of-pocket subtotal <u>5/</u>	16.98-36.03	23.50	13.55-42.16	20.54	11.81-27.98	18.39	13.78-21.46	16.75
Depreciation.....	1.84- 8.95	3.76	1.54- 6.65	3.06	1.99- 6.17	4.15	2.63- 6.81	4.07
Interest.....	0 - 2.36	.21	0 - 1.73	.13	0 - 6.94	.99	0 - .82	.24
Total.....	18.81-45.87	27.47	16.53-47.62	23.73	16.77-39.39	23.53	16.41-28.32	21.06
Standardized depreciation <u>6/</u>	2.40- 4.97	3.46	2.18-12.70	4.19	3.55- 6.90	5.13	3.12- 8.29	5.35
Standardized interest <u>6/</u>	1.69- 3.27	2.28	1.44- 8.03	2.68	2.11- 4.21	3.12	1.87- 5.00	3.23
Total standardized <u>7/</u>	21.26-44.25	29.25	18.23-62.89	27.42	17.48-38.90	26.64	18.76-34.75	25.32
								26.67

Individual cost items may not add to totals because of rounding.

1/ Rated hourly ginning capacity: Group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; group 4--21 bales or more. The universe includes all active gins in the study area. 2/ Taken from gin records and subjected to uniform allocation procedures--see appendix. 3/ Low and high values shown for individual cost items indicate ranges among sample gins within a size group. Since the same gin plant was not consistently lowest or highest for all cost items, individual costs will not add to totals shown. 4/ Sample averages across groups, weighted by each group's representative proportion of the total rated hourly ginning capacity in the study area gin universe. 5/ Sample gin costs excluding depreciation and interest. 6/ Sample gin costs using uniform rates in computing depreciation and interest--see appendix. 7/ Out-of-pocket costs plus standardized depreciation and standardized interest.

in total standardized costs. Thus, an increase in average plant capacity utilization of 17 percentage points lowered total operating costs per bale an estimated 14 to 15 percent.

Table 3--Estimated costs per bale in sample gin plants at 70 percent capacity utilization, by size group, and average for all plants, San Joaquin Valley, California, 1971/72 1/

Cost item <u>2/</u>	Group 1	Group 2	Group 3	Group 4	Weighted average
<u>Dollars</u>					
:					
Management.....					
Management.....	6.40	5.62	2.08	1.63	3.03
Insurance.....	.45	.41	.46	.44	.44
Taxes.....	.73	.67	.78	.74	.74
Energy.....	1.44	1.63	1.77	1.57	1.65
Labor.....	3.97	3.06	3.55	3.05	3.34
Bagging and ties....	3.11	3.00	3.66	3.70	3.48
Repairs.....	2.81	2.22	2.88	2.47	2.61
Miscellaneous.....	1.64	1.09	1.78	1.40	1.51
:					
Out-of-pocket	:				
subtotal <u>3/</u>	20.54	17.70	16.95	15.00	16.80
:					
Depreciation.....	2.81	2.20	3.29	2.96	2.91
Interest.....	.15	.10	.79	.18	.38
:					
Total.....	23.51	19.99	21.03	18.13	20.09
:					
Standardized	:				
depreciation <u>4/</u>	2.58	3.01	4.07	3.88	3.63
Standardized	:				
interest <u>4/</u>	1.70	1.93	2.47	2.35	2.24
:					
Total	:				
standardized <u>5/</u> ...	24.83	22.64	23.50	21.22	22.67
:					

Individual cost items may not add to totals because of rounding.

1/ See Cost Adjustments and Weighting in appendix. Rated hourly ginning capacity: Group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; group 4--21 bales or more. The universe includes all active gins in the study area.

2/ Taken from gin records and subjected to uniform allocation procedures--see appendix.

3/ Sample gin costs excluding depreciation and interest.

4/ Sample gin costs using uniform rates in computing depreciation and interest--see appendix.

5/ Out-of-pocket costs plus standardized depreciation and standardized interest.

APPENDIX: METHODOLOGY

Gins vary widely by type of organization, ownership structure, accounting procedures used, and in many other ways. In analyzing costs reported by sample gins, the uniform allocation procedures described below were used to compensate for some of the differences in accounting procedures.

Costs of hauling cottonseed and lint--such as truck drivers' wages, truck depreciation, insurance, road-use taxes, and associated truck-operating costs--and any other costs not directly related to gin processing were excluded.

Cost Allocations

Management: Where applicable, includes salaries, bonuses, commissions, expense allowances, house rent, and personal insurance policies for owners and managers; bookkeeping and other office salaries, and home office cost (line companies); social security; and workmen's compensation insurance and any other insurance on management and office personnel.

Depreciation: Includes allowances for depreciation exactly as carried on gin records except for standardized costs. (See Standardized sample gin costs below.)

Interest: Includes interest exactly as carried on gin records except for standardized costs. (See Standardized sample gin costs below.)

Insurance: Includes costs for all forms of insurance on gin buildings, equipment, housing furnished management and labor, cotton products, and automotive equipment (except large trucks and trailers).

Taxes: Includes all taxes on real property only.

Energy: Includes cost of all utilities--electricity, gas, and water--used in ginning and directly related operations.

Labor: Includes cost of gin wages, social security, and workmen's compensation and any other insurance on gin labor borne by the gin; plus any rental housing furnished labor (excludes gin repair labor: see Repairs below).

Bagging and ties: Includes actual cost of bagging and ties purchased.

Repairs: Includes cost of gin repair wages, social security, and workmen's compensation and other insurance on gin repair labor borne by the gin; plus the cost of repair materials and supplies.

Miscellaneous: Includes pickup, tractor, and other automotive expenses; telephone, telegraph, advertising, and promotion costs; legal and audit fees; dues, memberships and subscriptions; annual meetings and director's fees and expenses; conventions and travel expenses; donations and contributions; cotton losses from fire; sampling, compressing, and related

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charges; gin and office supply costs; and any other costs not included elsewhere.

Costing Methods

Sample gin costs: Gin costs which have been subjected to the above allocations are identified in this report as sample gin costs.

Standardized sample gin costs: Uniform rates for computing depreciation and interest on investment were used in developing standardized sample gin costs. Depreciation was set at 7 percent of the initial purchase price of capital items carried on the depreciation schedule regardless of age or former method of depreciation. Interest was charged at 8 percent on the estimated average value of the land comprising the gin site and 8 percent on one-half the cost of buildings, machinery, and equipment.

Out-of-pocket costs: Sample gin costs from which depreciation and interest have been excluded.

Cost Adjustments

Estimates of ginning costs at other than existing levels of capacity utilization were based on relationships assumed in the development of a series of model gins. See: Zolon M. Looney and Charles A. Wilmot, Economic Models for Cotton Ginning. U.S. Dept. Agr. Econ. Rpt. 214, Oct. 1971.

Weighting

In computing weighted averages, the simple weighted average cost per bale for each group was further weighted by its representative proportion of the total rated hourly ginning capacity in the San Joaquin Valley of California.

